

# IN THE CLAIMS

1           1.       (currently amended) A method for maintaining cache coherency in a  
2 system having a first controller and a second controller, comprising:  
3           selecting a mirror cache line in a second controller to copy data into;  
4           mirroring the data from a cache line in a first controller to the mirror cache line in  
5 the second controller; and  
6           sending a message from the first controller to the second controller informing the  
7 second controller of cache meta data associated with data in the mirror cache line.

A1  
1           2.       (original) The method of claim 1, wherein the first controller has  
2 information about the content of the second controller's cache, and the second controller  
3 has information about the content of the first controller's cache.

1           3.       (currently amended) The method of claim 1, wherein the cache meta data  
2 includes a logical unit number, a logical block number, a dirty bit map, and a cache  
3 identifier for the data associated with the mirror cache line.

1           4.       (currently amended) The method of claim 1 further comprising placing  
2 the address of the mirror cache line into a hash table of the first controller ~~the first~~  
3 ~~controller's hash table~~.

1           5.       (currently amended) The method of claim 1 further comprising placing an  
2 [[the]] address of the mirror cache line into the first controller's write back queue.

1           6.       (original) The method of claim 1 further comprising managing a free list  
2 of mirror locations in the second controller's cache by the first controller, and managing a  
3 free list of mirror locations in the first controller's cache by the second controller,  
4 wherein the first and second controllers can copy data into the second and first  
5 controller's mirror locations, respectively.

1           7.       (original) The method of claim 1, further comprising sending a message  
2 from the first controller to the second controller, requesting ownership of a cache line  
3 owned by the second controller.

1           8.       (original) The method of claim 7, further comprising granting ownership  
2 of a cache line owned by the second controller, to the first controller, wherein,  
3 subsequent to the first controller receiving data that is to be mirrored to the second  
4 controller cache line, transferring data to the second controller's cache line from the first  
5 controller.

1           9.       (currently amended) The method of claim 8, further comprising sending a  
2 message from the first controller to the second controller providing the second controller  
3 with [[of]] data in cache meta data associated with the mirror cache line.

1           10.      (original) The method of claim 1, further comprising switching ownership  
2 of cache lines between the first controller and the second controller.

1           11.      (original) The method of claim 1, further comprising, during failback,  
2 transferring cache lines from a survivor controller that owns a substantial number of  
3 mirror cache lines, to a replacement controller unit.

1           12.     (original) The method of claim 1, further comprising, sending a message  
2 to a controller of a mirror cache line, informing the controller that the associated cache  
3 line will be flushed and the data associated with the mirror cache line will be temporarily  
4 invalid.

A<sub>1</sub>  
1           13.     (currently amended) The method of claim 12, wherein sending the  
2 message to the controller of the mirror cache line further comprises[[,]] informing the  
3 controller that after the associated cache line is flushed ~~destaged~~, and the mirror cache  
4 line's data is consistent with a backing disk and need not be written to the backing disk in  
5 the event of a failover.

1           14.     (currently amended) The method of claim 1, further comprising[[,]]  
2 indicating to the first and second controllers ~~controller~~ that a cache line that has been  
3 flushed of data[[,]] is available for reuse.

1           15.     (currently amended) A controller system for maintaining cache  
2 coherency, comprising:  
3           a disk array,  
4           a first controller, coupled to the disk array, for selecting a mirror cache line on a  
5 second controller; and  
6           an interface for mirroring the data from a first controller cache line to the second  
7 controller cache line;  
8           wherein a message is sent from the first controller to the second controller  
9 informing the second controller about cache meta data associated with data in the mirror  
10 cache line.

1           16.     (original) The controller system of claim 15 wherein the first controller  
2 has information about the content of the second controller's cache, and the second  
3 controller has information about the content of the first controller's cache.

1           17.     (currently amended) The controller system of claim 15, wherein the cache  
2 meta data includes a logical unit number, a logical block number, a dirty bit map, and a  
3 cache identifier associated with the mirror cache line.

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1           18.     (currently amended) The controller system of claim 15 further comprising  
2 the first controller placing an [[the]] address of the mirror cache line into a hash table of  
3 the first controller ~~the first controller's hash table~~.

A,  
1           19.     (currently amended) The controller system of claim 15 further comprising  
2 the first controller placing an [[the]] address of the mirror cache line into a write back  
3 queue of the first controller ~~the first controller's write back queue~~.

1           20.     (original) The controller system of claim 15 further comprising the first  
2 controller managing a free list of mirror locations in the second controller's cache, and  
3 the second controller managing a free list of mirror locations in the first controller's  
4 cache, wherein the first and the second controller can copy data into the second and the  
5 first controller mirror locations, respectively.

1           21.     (original) The controller system of claim 15, further comprising the first  
2 controller sending a message to the second controller, requesting ownership of a cache  
3 line owned by the second controller.

1           22.     (original) The controller system of claim 21, wherein the second  
2 controller sends a message granting ownership of a cache line owned by the second  
3 controller, to the first controller, wherein, subsequent to the first controller receiving data  
4 that is to be mirrored to the second controller cache line, transferring that data to the  
5 second controller's cache line from the first controller.

1           23.   (currently amended) The controller system of claim 22, further  
2   comprising the first controller sending a message [[from]] to the second controller  
3   informing the second controller of cache meta data associated with data in the mirror  
4   cache line.

1           24.   (original) The controller system of claim 15, wherein the first and second  
2   controllers switch ownership of cache lines.

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1           25.   (original) The controller system of claim 15, further comprising, during  
2   failback, a survivor controller that owns a substantial number of mirror cache lines  
3   transfers associated cache lines to a replacement controller unit.

1           26.   (original) The controller system of claim 15, wherein a message is sent to  
2   a controller of a mirror cache line, informing the controller that the associated cache line  
3   will be flushed and the data associated with the mirror cache line will be temporarily  
4   invalid.

1           27.   (currently amended) The controller system of claim 26, wherein the  
2   message that is sent to the controller of the mirror cache line further comprises[[,]]  
3   informing the controller that after the associated cache line is flushed ~~destaged~~, the mirror  
4   cache line's data is consistent with a backing disk and need not be written to the backing  
5   disk in the event of a failover.

1           28.   (currently amended) The controller system of claim 15, further  
2   comprising[[,]] indicating to the first and second controllers ~~controller~~ that a cache line  
3   that has been flushed of data is available for reuse.

1           29.     (currently amended) An article of manufacture comprising a program  
2 storage medium readable by a computer, the medium tangibly embodying one or more  
3 programs of instructions executable by the computer to perform a method for maintaining  
4 cache coherency, the method comprising:

5           selecting a mirror cache line in a second controller to copy data into;  
6           mirroring the data from a cache line in a first controller to data in the mirror cache  
7 line in the second controller; and  
8           sending a message from the first controller to the second controller informing the  
9 second controller of cache meta data associated with the mirror cache line.

1           30.     (currently amended) A storage system for maintaining cache coherency,  
2 comprising:  
3           means for selecting a mirror cache line in a second controller to copy data into;  
4           means for mirroring the data from a cache line in a first controller to data in the  
5 mirror cache line in the second controller; and  
6           means for sending a message from the first controller to the second controller  
7 informing the second controller of cache meta data associated with the mirror cache line.

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